to the invention. This comparison is made first followed by arguments under their respective headings.

COMPARISON OF OBJECTS AND EFFECTS OF HOSHINO AND THE INVENTION

The claimed invention, as detailed in paragraph [0001] of its published application, relates to a martensitic stainless steel that has high mechanical strength and excellent corrosion resistance such as sulfide stress cracking resistance, corrosive wear resistance, and localized corrosion resistance. In contrast, Hoshino is concerned with a steel material that has large elongation properties and superior resistance to softening by welding. The steel material of Hoshino does not have application in the field of oil country tubular goods and line pipes, which are employed in drilling and constructing oil and gas wells. These wells produce oil and natural gas that contains carbon dioxide and a trace of hydrogen sulfide, as well as in transportation and storage thereof, see paragraph [0001] of the published application.

Consequently, the allegation that Hoshino discloses the same utility through the disclosed range of composition is an inaccurate statement on the part of the Examiner. The invention and Hoshino are not related in object, utility, and effect and this must be taken into account when assessing the patentability of the claims.

CLAIMS 1-8

The amount of carbides in grain boundaries of the prior austenite is not more than 0.5 volume %

In the rejection, the Examiner alleges that Hoshino establishes a *prima facie* case of obviousness against claims 1-8 based on an alleged overlap in composition and similarity in processing. The Examiner admits Hoshino does not teach the limitation regarding the carbides at the grain boundaries but contends that the feature is inherent in Hoshino based on similar processing.

This position is incorrect when the processing of Hoshino is closely considered. Hoshino teaches a process to prepare a high strength stainless steel material having excellent workability that is free from weld softening. The steel is a single martensitic phase or a duplex phase structure of martensite and minute austenite. In order to attain this structure, Hoshino heat treats a cold rolled steel at a temperature of 550-675 °C for 1 to 30 hours. No annealing is performed between the cold rolling step and the heat treatment step. The steel being processed consists essentially of C: not more than 0.10%, Si: 0.85-4.5%, Mn: 0.20-5.0%, P: not more than 0.060%, S: not more than 0.030%, Cr: 10.0-17.0%, Ni: 3.0-8.0%, N: not more than 0.10%, and Fe and inevitable impurities. Hoshino defines a Ni equivalent as Nieq=Ni+Mn+0.5Cr+0.3Si+20(C+N) and Nieq is in the range of 13.0-17.5. In addition, at least one of Cu, Mo, W, and Co being not more than 4% in total and/or at least one of Ti, Nb, V, and Zr being in a range of 0.1-0.8% in total can be optionally and selectively contained in the above composition under the condition that the Nieq value should be redefined to include the selected optional elements.

The invention of Hoshino is described in col. 1, lines 11-13 as relating to a high strength stainless steel material having excellent workability and resistance to

softening by welding, which enables the production of a structural member with a large elongation property and superior resistance to softening by welding. The steel has a hardness of Hv 271-369 (25.7-37.6 HRC), as detailed in the inventive examples of Table 2 of Hoshino.

While there may be some similarities in the composition of Hoshino and in the hardness obtained by Hoshino as compared to the invention, the processing of Hoshino is not similar to that employed by the invention. This difference precludes the stance of inherency to address the limitations regarding carbides and the grain boundaries. As explained above, Hoshino treats the cold rolled steel with a heat treatment in the range of 550-675 °C for 1 to 30 hours. This is contrasted with the invention, wherein the steel is treated at a temperature of 400 °C or less, see page 15, lines 10-15 of the specification. This tempering treatment is critical in controlling the amount of carbides in the grain boundaries to be not more than 0.5 volume percent.

Given the higher temperature and longer times used by Hoshino than the invention in terms of heat treatment, and the fact that Hoshino does not teach a composition that parallels the inventive one, one of skill in the art would have no expectation that the level of carbides in the grain boundaries would be less than 0.5% by volume. Instead, the artisan would expect that the amounts of carbides in the grain boundaries would be much greater than that claimed.

This difference in processing is a key distinction between Hoshino and the invention. This difference is accentuated by the fact that Hoshino really does not

lead one of skill in the art to the claimed composition in spite of the overlapping similarities as explained below. Another accentuating difference is the obvious disparity between the object and effect of the Hoshino as compared to the object and effect of the present invention.

Lacking a basis to contend that Hoshino teaches a processing that is similar to the one employed in the instant invention to obtain the claimed level of carbides in the grain boundaries; there is no basis for the Examiner to assert that this claim limitation is somehow inherently found in Hoshino. Thus, the rejection is improper on this basis alone and must be withdrawn.

Compositional Differences

While the Hoshino may appear to be similar to the claimed composition, the criticality of the presence of Cu is not realized by Hoshino. Whereas the claims require 0.5 to 5% Cu, Hoshino considers Cu to be an optional element. Cu in the invention is necessary to insure resistance to sulfide stress corrosion cracking. In Hoshino, Cu is employed in certain examples, i.e., Sample Nos. 6, 9, 25, 26, 28, and 31 in Table I. However, Hoshino still does not realize the importance of Cu in terms of sulfide stress cracking and does not lead one of skill in the art to control the Cu in the claimed range.

Additionally, the compositions that may contain Cu in Table I of Hoshino do not parallel the composition of the invention. In Sample 6, the contents of Ni and S exceed the compositional ranges. In Sample 9, the Ni content exceeds the ranges found in the claims. In Sample No. 25, the contents of Ni and Si exceed the ranges

found in the claims. Sample No. 26 exceeds the amount of Ni, S, and Si found in the claims, and Sample No. 28 exceeds the levels of Ni, S, P, and Si found in the claims as well as teaching less than the required amount of C. Therefore, it cannot be said that these Samples lead one of skill in the art to control the compositional ranges as set forth in the claims.

Further in Samples 18, 23, and 30, each which containing Al as an optional selection, the Al content far exceeds the claimed upper limit of 0.05%, which is another indication that the compositional control of the various claimed ranges is not found in Hoshino.

In addition, Applicants submit that the control of the composition and processing leads to a steel composition that provides unexpected improvements in terms of resistance to sulfide stress cracking. The comparative evidence in the specification demonstrates that not only does the composition have to be controlled within the claimed ranges; the processing must also be controlled. This comparative evidence demonstrates that the invention cannot be arrived at through the teachings of Hoshino, especially since Hoshino is not even concerned with the problems faced by the inventors. Therefore, the contention that Hoshino may somehow lead to the invention is rebutted by the comparative evidence of the specification showing unexpected improvements in sulfide stress cracking resistance as well as other improved corrosion resistance characteristics.

CLAIMS 13-20

The rejection of claims 13-20 combines Hoshino and Kushida. Here, the Examiner admits that Hoshino does not teach the claimed levels of Mo and Cu, and relies on Kushida to allege that it would be obvious to include the claimed levels in the composition of Hoshino. The reasoning supporting this conclusion is that Kushida teaches the Cu and Mo provide improved sour gas resistance in Hoshino.

While Applicants contest the reasoning for combining Kushida with Hoshino, the rejection of claims 13-20 fails since the limitations therein are not taught by Hoshino as demonstrated above, and Kushida does not teach the missing limitations. In Kushida, there is neither a description nor a suggestion about the core limitation in claims 13-20 regarding the amount of carbides in grain boundaries being not more than 0.5% by volume. Moreover, Kushida is unrelated to the goal of the invention as expressed in paragraph [0021] of the published application. Here, it is observed that no $M_{23}C_6$ carbides are in the grain boundaries in the hot worked or quenched conditions. Performing the tempering treatment to minimize the carbide formation in the grain boundaries means that resistance to sulfide stress corrosion cracking is improved. Again, this aim is not in the least suggested in Kushida.

Lacking the core limitations of claim 1, even if Kushida were properly combined with Hoshino, a *prima facie* case of obviousness would not be established.

Applicants also believe that the Examiner is picking and choosing alloying elements from Kushida to support the rejection without a proper reason. Kushida's

aim of improved corrosion resistance may be similar to that of Applicants' but it is unrelated to the aim of Hoshino. Therefore, Applicants assert that one of skill in the art would not seek to improve sour gas resistance in Hoshino when an application of the tube of Hoshino does not create a need to solve such a problem.

In light of the above, claims 13-20 are patentable over the applied prior art in the same way that claims 1-8 are patentable.

SUMMARY

In light of the above, Hoshino cannot establish a *prima facie* case of obviousness since the claim limitation regarding the carbides in the grain boundaries cannot be said to be inherent. Also, any allegation that Hoshino teaches the claimed composition is rebutted by the comparative evidence set forth in the specification. Lastly, Kushida does not make up for the failings of Hoshino and even if combined therewith, the invention of claims 13-20 is not taught.

In light of this response, the Examiner is respectfully requested to examine this application in light of this amendment, and pass claims 1-8 and 13-20 onto issuance.

If the Examiner believes that an interview with Applicants' attorney would be helpful in expediting prosecution of this application, the Examiner is respectfully requested to telephone the undersigned at 202-835-1753.

Again, reconsideration and allowance of this application is respectfully requested.

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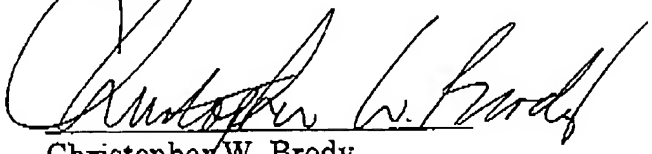
The above constitutes a complete response to all issues raised in the Office Action dated September 17, 2007.

A petition for a one month extension of time is made. Please charge deposit account no. 50-1088 the amount of $120.00 to cover the cost of the petition. Please charge any fee deficiency or credit any overpayment to Deposit Account No. 50-1088.

Respectfully submitted,
CLARK & BRODY



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